

## Laser Ablation of Urethral Hair

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**Background and Objective:** Two separate cases involving laser ablation of hair follicles in the neourethra are described.

**Study Design/Materials and Methods:** Urethral hair developed secondarily to free-flap urethroplasty for congenital urethral defects. In both cases, cystoscopic depilation with electrocautery fulguration was attempted on multiple occasions.

**Results:** No improvement was seen; therefore, laser ablation was employed. Both patients remain free of regrowth at greater than one year of follow-up. *Lasers Surg. Med.* 24:261–263, 1999.

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**Key words:** Nd:YAG laser; urethroplasty

### INTRODUCTION

Hypospadias is a congenital disorder that affects approximately one in 300 male births [1]. It is caused by the failure of the embryonic urethral tube to close completely; subsequently, the urethral meatus may be found anywhere between the glans penis and the perineum [1]. Multiple surgical techniques have been employed to correct the functional and cosmetic defects associated with hypospadias including the use of free-flap urethroplasty [2].

Because of the hair-bearing potential of groin and scrotal harvest sites, the development of hair within the neourethral lumen is a potential complication of the procedure. If hair growth is significant, urinary infections and calculi formation may occur [3,4]. Previously described local measures include depilation and calculus removal, cystoscopic fulguration, and excision of the neourethra [3]. The present report relates our experience with two patients suffering from urethral hair and our successful therapeutic use of the diode laser in ablation of the hair follicles.

### CASE REPORTS

Patient A is a 30-year-old Caucasian man who had post-nonglaborous skin urethroplasty approximately 20 years previously. The patient has suffered from recurrent hair-bearing urethral calculi and urinary infections since that time (Fig.

1). In the operating room, the patient was placed in the dorsal lithotomy position, and the calculi and urethral hairs were removed with grasping forceps followed by diode-laser (810 nm; Ga AlAs, Diomed, United Kingdom) ablation of the follicles. The laser was delivered transurethraally through a side-firing 2-cm contact laser fiber (Urolase optical film, Bard; waves reflect the light at a 90° angle). The laser was aimed directly at the follicles at a power of 20 W for 2 sec per pulse.

Because of the extensive number of follicles, approximately one-third of the existing follicles was ablated. Complete ablation required two more identical procedures; however, the laser was set at 15 W and fired for 2 sec in second and third ablations. The decision was made to complete the ablation in steps to reduce the risk of urethral stricture formation, and each procedure was separated by a period of four months to ensure proper healing of the previously irradiated neourethra. The wattage used during the second and third procedures was reduced when it was noted three months from the initial procedure that the irradiated neourethra still had some inflamed and edematous areas. This condition was not noted after the second and third procedures. Also, no

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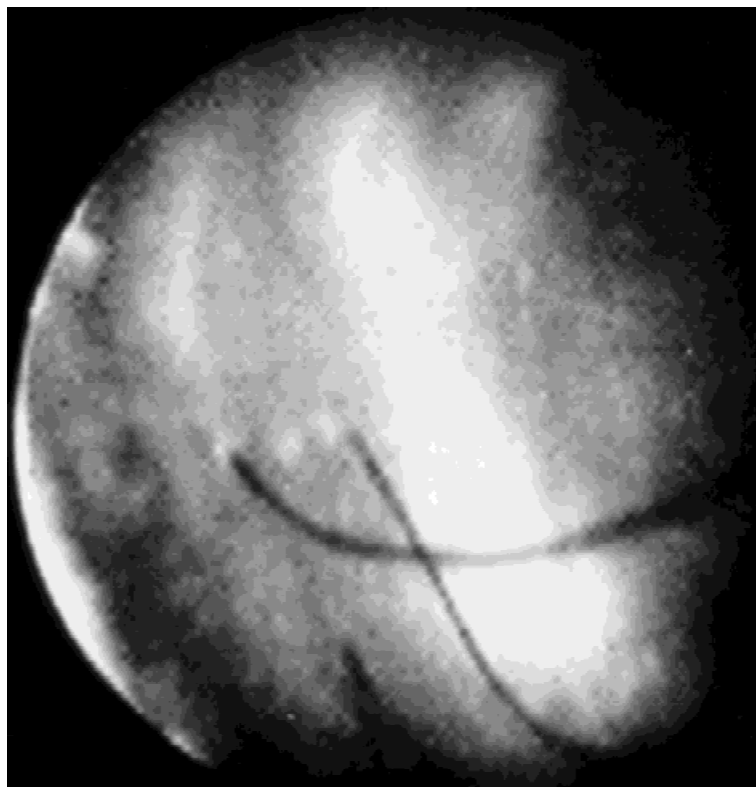


Fig. 1. Cystoscopic view of multiple urethral hairs.

hair growth was noted from the previously irradiated areas at the time of the third ablation. No hair has been documented by cystoscopy 1 year later.

Patient B is a 36-year-old man who underwent a primary bladder turn in for repair of bladder exstrophy at the age of nine months. The patient has had numerous problems since that repair, which resulted in a two-stage epispadias repair in 1987. Nonglabrous skin was used in the formation of the neourethra, and the patient subsequently experienced recurrent urinary infections and recurrent urethral stone formations. Before the patient was seen in our clinic, treatment had consisted of interval depilation approximately every three months. The patient underwent transurethral laser ablation of the new epithelial hair follicles under general anesthesia in a fashion similar to that of patient A (Fig. 2). However, only one treatment was necessary. Cystoscopy at 18 months showed no recurrent hair growth.

## DISCUSSION

The surgical correction of the hypospadiac or epispadiac meatus has undergone a great deal of

change since the first successful correction in 1842 [5]. The free graft urethroplasty was described by Devine and Horton [6] and was an innovative treatment for many severe cases of hypospadias. Generally speaking, for these grafts and for many of the other repairs, non-hair-bearing skin was recommended. Other than the prepuce, the region of the iliac crest, inter aspect of the arm, or the skin behind the ear can be selected. In our hands, bladder mucosa or even buccal mucosa may even be used in this repair. The choice of skin, especially in the prepubescent male, is sometimes difficult because the hair-bearing potential of the skin that is chosen may not be readily ascertainable.

One of the recognized complications of this type of urethral reconstruction has been hair that develops within the urethra. This complication ultimately causes urinary tract infections and stone disease, especially where there is a pooling of urine within the neourethra. Fistula formation and development of abscesses has occurred, and many techniques, especially those using intraoperative depilation of the skin, have been employed; however, the effect and complications of this technique on the hair in the urethra is not

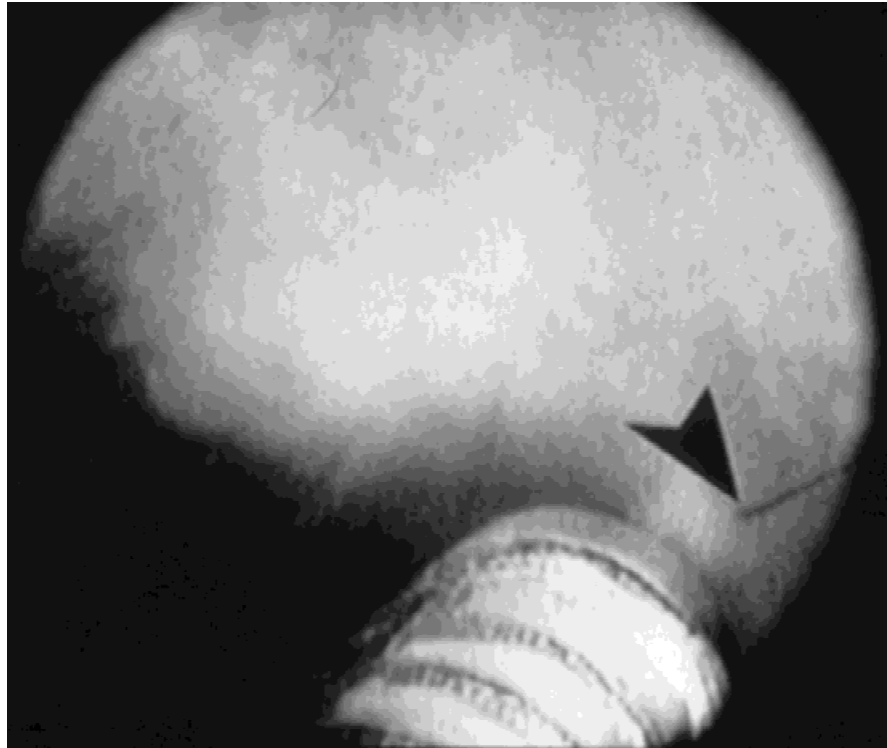


Fig. 2. Blanching of hair follicle (arrowhead) after laser treatment.

clear. Once some of these complications can be recognized, the choices for repair, correction, or removal of the hair and calculi may be done either cystoscopically or by fulguration of the hair follicle by using the electrocautery. In both patients, these techniques had been used without long-term efficacy. The most widely recommended treatment is excision of the hair-bearing urethral portion and reconstruction with the non-hair-bearing skin. This treatment results in the possibility of stricture formation, infection, fistula, and chordee and necessitates a long healing process.

In these two patients, we have employed depilation of the hair, with laser ablation of the hair follicle. Using the diode laser in pulses of 2 sec each, the depth of penetration for this power setting is approximately 1–2 mm, deep enough to ablate the hair follicles. Diode lasers (810 nm) have little ability to penetrate tissue, and their effect is confined to the surface of the tissue target [7]. This is an important factor to be considered when laser radiation is to be given in the urethra because of the potential complication of fistula formation, especially in patient B, in whom there was thin ventral tissue. These patients have had no hair recurrence with this technique and, with

some degree of caution regarding time and power setting, we feel that this may offer a permanent solution to patients with this difficult problem.

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